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14. ABSTRACT

Patient satisfaction and variables attributable to determining the best means to ensure patients experience high satisfaction are important to any medical organization. At Moncrief Army Community Hospital (MACH) at Fort Jackson, South Carolina, significant improvements in patient satisfaction were realized when as a matter of policy every patient was encouraged to complete a customer satisfaction card at each appointment. This was due to several factors, most significant among them is that patients tended to complete patient satisfaction surveys due to a less than positive experience. Regardless, once the policy of proactively requesting patient feedback was in place, average monthly patients satisfaction scores essentially remain unchanged. Though relatively positive averaging 4.48 on a 5-point Likert scale (see Appendix, Table #), an investigation into factors contributing to patient satisfaction is helpful to determine whether specific variables may correlate to patient satisfaction scores.

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Army-Baylor University Graduate Program in Health and Business Administration

Patient Satisfaction and Productivity

Graduate Management Project
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Abstract

Background: Patient satisfaction and variables attributable to determining the best means to ensure patients experience high satisfaction are important to any medical organization. At Moncrief Army Community Hospital (MACH) at Fort Jackson, South Carolina, significant improvements in patient satisfaction were realized when as a matter of policy every patient was encouraged to complete a customer satisfaction card at each appointment. This was due to several factors, most significant among them is that patients tended to complete patient satisfaction surveys due to a less than positive experience. Regardless, once the policy of proactively requesting patient feedback was in place, average monthly patients satisfaction scores essentially remain unchanged. Though relatively positive averaging 4.48 on a 5-point Likert scale (see Appendix, Table #), an investigation into factors contributing to patient satisfaction is helpful to determine whether specific variables may correlate to patient satisfaction scores.

Methods: The results of this retrospective relational study are demonstrated with the use of a scatter plot displaying bivariate relationships between patient satisfaction and RVUs, and patient satisfaction and encounters. Based on the bivariate relationships, a correlation coefficient, *r*, was calculated that defines the effect one bivariate has upon the other. Construct and convergent validity were be utilized to determine the validity of the data/results and internal consistent reliability was used to detail the reliability of the data/results.

Results/Conclusions: Results were surprising. A review of the literature demonstrates the likely intuitive result that more provider encounters and a greater number of generated RVUs are possible only to the peril of the provider/patient relationship; productivity and encounters are negatively related to patient satisfaction score. Given a larger sample from a more varied

population that may be true, however at MACH, under the conditions of this study, research

demonstrates 16% of variance is accounted for between productivity and encounters, $(F(2,96) =$

10.279, $p < .0001)$ and that as encounters increase, so do access and patient satisfaction.

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Introduction

Dr. Avedis Donabedian demonstrated a path to assess quality in his article, "The Quality of Care, How Can It Be Assessed?" (Donabedian, 1988). To a patient, a positive health outcome is clearly paramount, even beyond their ability to afford care. To an organization, however, a positive outcome must include the costs involved with care in relation to outcomes and a patient's perception of the care he received. In his article, Donabedian posits that quality care may be separated from efficiency, essentially the costs associated with care, by means of defining what is meant by both (Donabedian). By determining a definition of both, and the means to measure them, one may define the constructs of an effective organization in terms of both care provided and financial vitality. As with other organizations, The Military Health System (MHS) maintains a focus on productivity. While health outcomes are the most important aspect of the care provided within this system, a very visible focus is also placed on patient satisfaction. Taking a patient centered approach, in August 2007, MG Gail Pollock, the Acting Army Surgeon General, issued a memorandum to all Army Medical Command subordinate commanders regarding improving customer service. Among her goals, MG Pollock cited a patient satisfaction survey target of not less than 95% overall satisfaction to ensure "satisfied and loyal customers" (Pollock, 2007). Given this, a meaningful way to determine the effectiveness of the MHS is to compare patient satisfaction/centeredness to productivity to learn whether focus on one may be a detriment to the other. As a stand alone study, the conclusions drawn may be eventually compared to outcomes to further define Quality. This research seeks to define effectiveness by analyzing the effect of patient centeredness on both a provider's and the respective Healthcare Facility's ability to most efficiently provide medical care, and answers the question, "does Patient Centeredness, defined as Patient Satisfaction score, compromise Efficiency, defined as weighted RVU/FTE/Day and Encounters/FTE/Day?"

Conditions Prompting The Study

As the MHS strives to keep patient satisfaction high while continuing to increase productivity and simultaneously keep costs low, it seems a focus on patient satisfaction/centeredness is becoming the most important concern among providers (discounting the number one priority of their patients' health). During the last fiscal year, Moncrief Army Community Hospital (MACH) ranked second overall among small Army hospitals in both RVU and RWP increases, with 24.1% and 22.9% increases respectively, while continuing to enjoy high satisfaction among its beneficiary population. As with other organizations and for myriad reasons, MACH also has a backlog of patients in some areas such as in radiology. While this may be due to any number of reasons, a provider once mentioned that due to low patient satisfaction scores, it is not out of the norm to provide a patient a service requested though not necessarily required. For instance, a patient with a knee problem may require a specific protocol of treatment evident to a provider however the patient may insist on an MRI or other service. Based on the patient's preference, a provider may then schedule that service. The effect of this interaction is interesting. The patient feels he was part of his treatment and that his opinion mattered and the provider may enjoy a high satisfaction score. Counter to that, however, is that an MRI is scheduled in a backlogged clinic at the cost of over $1,000. The result is that to satisfy the patient in one clinic, another clinic gains a burden and the organization loses money. In an editorial in *Modern Healthcare*, the authors define high value healthcare by explaining that "Healthcare professionals must work diligently to provide patients with high-value healthcare- a quality outcome and a satisfied patient with the lowest possible cost' (Cortese & Smoldt, 2007). It is discussed in "Crossing the Quality Chasm: A New Health System for the 21st Century", a body of work often cited in professional literature. But it must be better understood if the future of healthcare is to be optimally run. In *The Future Of Family Medicine*, the authors explain "to

run the family medicine practice of the future efficiently, while adapting to a changing practice

environment and striving to deliver optimal patient and population-based care, family physicians

will need more in-depth training in practice management" (Martin, et al., 2004). Invoking

Crossing the Quality Chasm, the authors include the table below.

Table 1. *Simple Rules For the 21st Century*

Simple Rules for the 21st Century Health Care System	
Current Approach	**New Rule**
Care is based primarily on visits	Care is based on continuous healing relationships
Professional autonomy drives variability	Care is customized according to patient needs and values.
Professionals control care	The patient is the source of control
Information is a record	Knowledge is shared and information flows freely
Decision making is based on training and experience	Decision making is evidence-based
Do no harm is an individual responsibility	Safety is a system property
Secrecy is necessary	Transparency is necessary
The system reacts to needs	Needs are anticipated
Cost reduction is sought	Waste is continuously decreased
Preference is given to professional roles	Cooperation among clinicians is a priority rather than the system
Source: *Crossing the Quality Chasm: A New Health System for the 21st Century.*	

The sterility of the left column (Current Approach) is clearly made more patient-centered by the

column on the right (New Rule) but it seems the column on the right may be harder to decipher.

"The patient is the source of control" is of particular concern within the MHS and specific to the

anecdotal conditions that prompted this study in terms of how a MHS facility may be most

effectively operated.

Statement of the Problem

Does Patient Centeredness, defined as Patient Satisfaction score, compromise Efficiency,

defined as weighted RVU/FTE/Day and Encounters/FTE/Day, and thus become detrimental to

an MHS Healthcare Facility's Effectiveness? Clearly a balance must emerge that maximizes a

provider's ability to work efficiently while ensuring the Surgeon General's goal of 95% overall patient satisfaction is met. Granted, this balance may differ by individual provider and his or her assigned beneficiary population however an empirical model demonstrating an organization's success balancing efficiency and satisfaction will prove helpful to determine measures of success for future studies regarding efficiency and patient satisfaction.

Literature Review

Donabedian defines effectiveness as "improvement in health that is achieved, or can be achieved, under ordinary circumstances of everyday practice" (Donabedian, 1990). This definition, minimally edited, helps define an effective organization: improvement in an organization that is achieved, or can be achieved, under ordinary circumstances of everyday practice. This thought process is not unstudied. Keeping costs low and remaining competitive, a decidedly fiscal approach, is directly related to what drives patient satisfaction and further defines outcomes: "outcome assessment in the context of cost containment serves two roles: measuring the relative effectiveness of various therapies in order to find cost effective ones, and monitoring the system to detect deterioration in quality" (Jackson, 1997). Further, taking from Donabedian's Theory of Quality, strict adherence to structure and process are not enough to overcome deleterious outcomes in terms of health, satisfaction, or cost (O'Connor & Lanning, 1991). In relative terms, very few seminal articles related to patient satisfaction within the MHS begin without mention of the institution of TRICARE. TRICARE was born from the rising costs of healthcare and as a means of organizing care such that the greatest good may come to the greatest number of beneficiaries. The relationship between the importance of perceived quality and financial viability to patients is self evident; costs must be kept down without sacrificing quality (Tucker & Manchus, 1998). Still, healthcare needs and resources are at odds and there remain "difficult trade offs among costs, quality, and access" (Jennings, et al., 2005). The MHS

continues to experience discrepancies in patient to provider ratios; research reveals that changes in beneficiary population do not follow changes in provider with fewer providers servicing ever more beneficiaries (Jennings, Hemman, Heiner, Swanson, & Loan, 2005). The MHS thus asks more of its providers while beneficiaries, perhaps accustom to a "more with less" culture, remain within the system. Or do they? Clearly, in some markets beneficiaries eschew care provided by an MHS facility opting for care in the civilian market, at times running afoul of the increased population an MHS facility may encourage. While fewer beneficiaries served effects the "bottom line" of an organization, perhaps it provides the greatest opportunity for an organization to effectively earn revenue while still keeping patients satisfied; but this is not necessarily optimal, more is better. Because of this, it is important to explore patient satisfaction and how to maximize it to determine how palpable its effect may be on revenue; it is important to determine the emphasis an organization should give patient satisfaction and find the best way to mitigate patient satisfaction while ensuring costs are low and revenue is high.

In 2003, Drs. Mangelsdorff and Finstuen published a study on patient satisfaction that examined demographic and attitudinal components of patient satisfaction with the MHS. In a later study published in 2005 with Larsen and Weinberg, they refined their model to include differences among services, beneficiary status, beliefs about care, and waiting times, and again found tangible results that effect patient satisfaction. Their results demonstrate that the greatest influence on patient satisfaction came from the care received with the provider. It is the provider-patient relationship that may dominate patient satisfaction and it is the time a doctor/provider spends with patients, maximizing a flow of patients, that dictates revenue. Of equal importance are the services prescribed by the provider; a patient's rating of his doctor is multi-faceted.

While patient demographics are important, provider demographic is also a function of the patient's reported satisfaction. A patient's satisfaction may be initially influenced based on physician demographics. Whether a doctor's relationship with his patient effects the patient's health directly is not well understood but research shows "physician demographics and personality traits influence patient's ratings" (Duberstein, Meldrum, Fiscella, Shields, & Epstein, 2007). In an article published in *Patient Education and Counseling*, Duberstein, et al., cited social cognition theory as a reason for how a patient may rate his satisfaction. A patient may be predisposed to assume poor satisfaction without much influence attributable to a positive experience with his physician. Another study concluded that a patient's expectation of visit duration, prior to the visit, had a significant effect on the patient's level of satisfaction (Lin, et al., 2001). Time spent with patients is directly related to the number of patients that may be seen and thus effects costs and revenue as will be discussed in further detail below. Regardless, a patient who chooses to remain in the MHS, while not without choices, is limited to the availability of providers in the organization. In another study, it was noted that "bedside manner" may play little role in influencing patient satisfaction and that most significance in patient satisfaction was noted in correct diagnosis and explanation of treatment options (Otani, Kurz, & Harris, 2005). Yet another study found that bed side manner and a perception of high respect were significantly related to patient satisfaction (Yancy, et al., 2001). Clearly, it would be irresponsible to suggest an optimal visit may occur with the absence of mutual respect and treatment with dignity and studies have proven that patients "treated with dignity were more likely to report higher levels of satisfaction, adherence to therapy, and receipt of preventive services" (Beach, et al., 2005). These studies are important because some offer a small exception to the thought that a provider may by action influence a patient's satisfaction.

Indeed, in 2003 the Israeli Defense Medical Corps completed a cross sectional study of primary care clinics of number of monthly patient visits and visits per provider per month using data collected from a previous study. They found that it was not the provider's workload that affected a patient's satisfaction rather it was the workload of the clinic in general that adversely affected satisfaction; obstacles to access not withstanding. This is important because it demonstrates that in terms of the doctor-patient relationship, even in a heavy workload setting, a doctor's increased workload was inconsequential to the patient's perception of his care (Mandel, et al., 2003). This is not surprisingly not always the case. Other studies have shown that busier providers, those with heavy workloads, do affect patient satisfaction negatively and clearly, as explained by Dr. Gordon Moore, "one of the biggest mistakes in primary care isn't what we do to a patient but what we omit" (Berry, Selders, & Wilder, 2003). In the MHS this may be translated that high RVUs and encounters lead to lower patient satisfaction scores- "although actual reduction in patient satisfaction associated with heavy or extremely heavy workloads was small, we believe this represents a clinically significant difference" (Feddock, et al., 2005). All of this research presents a vexing conundrum given the several contradictions but it is nonetheless unavoidable. The MHS is left with doing more with less in the environment in which exists, able to control very few factors. But aside from simply delighting patients, there are means available to increase the bottom line.

The Virginia Mason Production System is built around operating with the fewest resources to consistently deliver what is needed, where and when it is needed, "it is the method by which we manage and deliver on our mission and vision" (Johnson, 2005). The goal is to build patient trust in their providers while simultaneously encouraging providers to be the most productive. In *The Patient's Perspective*, Kircheimer points that pay for performance among providers ties directly into patient satisfaction and revenues. One study found that by changing

from equal compensation by all to compensation based on production and performance Primary Care Productivity increased, with no negative impact on patient satisfaction (Lewandowski, et al., 2006). This study was interesting because it demonstrated that providers worked harder and were better reimbursed even while compensation per RVU decreased. The best balance may then include providers compensated based on productivity. While productivity is a matter of time and the ability to see more patients, the medium must include a thorough exploitation of the patient's health keeping in mind that in may ways, patient satisfaction is not a science, rather it is an art.

Purpose

An effective organization balances its productivity and patient centeredness as demonstrated in Figure 1 below. The intent of this model is to demonstrate that productivity and patient centeredness must both be optimized in an organization. This model does not suggest a sliding relationship wherein as one construct changes, the other similarly changes, rather it is meant to show that both are independently important. For example, patient centeredness cannot exceed as score of 5.0 however RVUs and encounters essentially have no limit. Assigning a relationship that defines effectiveness as the product of patient centeredness and efficiency, for example, may demonstrate to a healthcare organization an optimal value of the product occurring wherein a lower acceptable patient satisfaction score is most closely related with high productivity without sacrificing acceptable productivity.
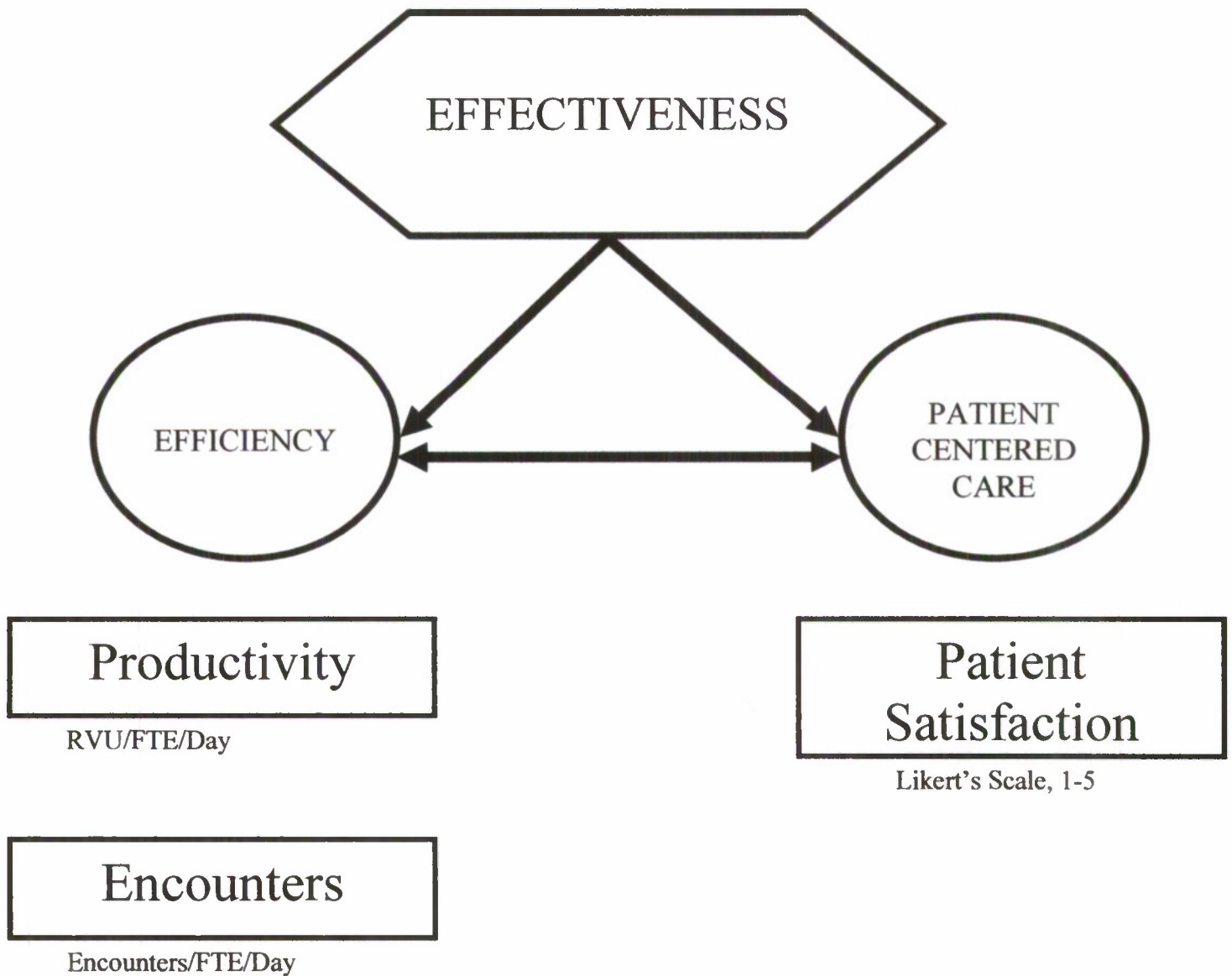
Figure 1. Model of Effectiveness

Hypothesis:

The higher a provider's patient satisfaction score, the lower the provider's Efficiency score.

Table 2. *Null and Alternate Hypotheses.*

Null Hypothesis (H$_0$): Increased patient centeredness has no relation to efficiency.

Alternative Hypothesis (H$_a$): Increased patient centeredness is inversely related to efficiency.

Ethical Considerations

Confidentiality was safeguarded by the fact that individual patient identifiers were not a part of the data utilized. Further, names of providers were replaced and designations were randomly assigned.

Methods And Procedures

The study setting was the Family Health Clinic at Moncrief Army Community Hospital. The subjects of the study were the 9 FTE providers employed at MACH for whom data on productivity and patient satisfaction are available. Data were collected from reported monthly patient satisfaction scores, Q7 on the Army Patient Satisfaction Survey, "Overall, how satisfied do you feel about your visit?" based on a five point scale as detailed in below in Table 3, Code Sheet.

Table 3. *Code Sheet.*

Variable	Description	SPSS Data Codes
Provider	Alpha Designation	A,B,C,D,E,F...L
Patient Satisfaction	1-5 Likert Scale	1-Completely Dissatisfied 2- Somewhat Dissatisfied 3-Neither Satisfied nor Dissatisfied 4-Somewhat Satisfied 5-Completely Satisfied
RVU/FTE/Day	RVU reported by full time employee per month	Continuous variable
ENC/FTE/Day	Encounters reported by full time employee per month	Continuous variable

Data were correlated to average monthly RVU's per provider, and monthly encounters per provider as displayed in Appendix A, Table 6. The period in the study utilized 1,307 monthly surveys between September 1, 2006 and August 31, 2007 and relative monthly RVU and encounter data from the same time period. It is important to note that this data does not include the month of June 2007 as this data is irretrievably lost to MACH.

The results of this retrospective relational study are demonstrated with the use of a scatter plot displaying bivariate relationships between patient satisfaction and RVUs, and patient satisfaction and encounters. Based on the bivariate relationships, a correlation coefficient, *r*, was calculated that defines the effect one bivariate has upon the other. Construct and convergent validity were be utilized to determine the validity of the data/results and internal consistent reliability was used to detail the reliability of the data/results. Descriptive statistics may be found in Appendix A, Table 7.

Results

Correlations between variables are reflected below in Table 4, Correlations Table. Notably, Correlations are significant at $p > .01$ between Patient Satisfaction Scores and both Encounters per Day per FTE and Average RVU per Encounter. Significance was also noted at $p > .01$ between Encounters per Day per FTE and Actual RVUs per Day.

As demonstrated below in Figure 2, Correlation of Patient Satisfaction Score and Encounters, as a provider's quantity of encounters increase, so does his overall patient satisfaction score. This was significant at $P > .01$, with $r = .318$. While this model holds true for the clinic as a whole, as graphically depicted in Figure 2, providers with comparatively low patient satisfaction scores tend to also report encounters, on average, below the overall mean of encounters. This plays a significant role in demonstrating positive correlation between Encounters Reported and Patient Satisfaction Score. Further, the deletion of data reflective of the bottom two performers would likely show a more even relationship between patients' reported satisfaction and providers' reported encounters.

Table 4. *Correlations Table*

		Encounters / Day / FTE	RVU / Day	PATSAT Score	Day	Average RVU / Encounter
Encounters	Pearson *r*	.	.849	.318	-.151	.027
	Sig, (2-tailed)		.000	.001	.137	.792
RVU	Pearson *r*	.849	.	.133	-.107	.499
	Sig, (2-tailed)	.000		.188	.293	.000
PATSAT	Pearson *r*	.318	.133	.	-.071	-.283
	Sig, (2-tailed)	.001	.188		.483	.005
Day	Pearson *r*	-.151	-.107	-.071	.	.052
	Sig, (2-tailed)	.137	.293	.483		.610
Avg RVU	Pearson *r*	-.027	.499	-.283	.052	.
	Sig, (2-tailed)	.792	.000	0.005	.610	

Note: Correlation is significant at p > .01 for: PAT SAT Score and both Encounters/Day/FTE and Average RVU/Encounter; and Encounters/Day/FTE and RVU/Day Actual.

Under the conditions of this study, research demonstrates 16% of variance is accounted for between productivity and encounters, ($F(2,96) = 10.279$, $p < .0001$), please see Table 5 below.

Table 5. *Analysis of Variance*

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.677	2	2.338	10.279	.000[1]
Residual	21.84	96	0.228		
Total	26.517	98			

Note: Predictors (Constant), Encounters/Day/FTE, Avg RVU/Encounter
Dependent Variable: PATSAT Score

Similarly, a correlation between Patient Satisfaction Score and RVU's generated is demonstrated in Figure 3, below with $P > .01$, and $r = .283$. Again, providers with comparatively low patient satisfaction scores tended to also report fewer RVUs generated per day. This also had a significant statistical effect in demonstrating positive correlation between RVUs generated per day and Patient Satisfaction Score.
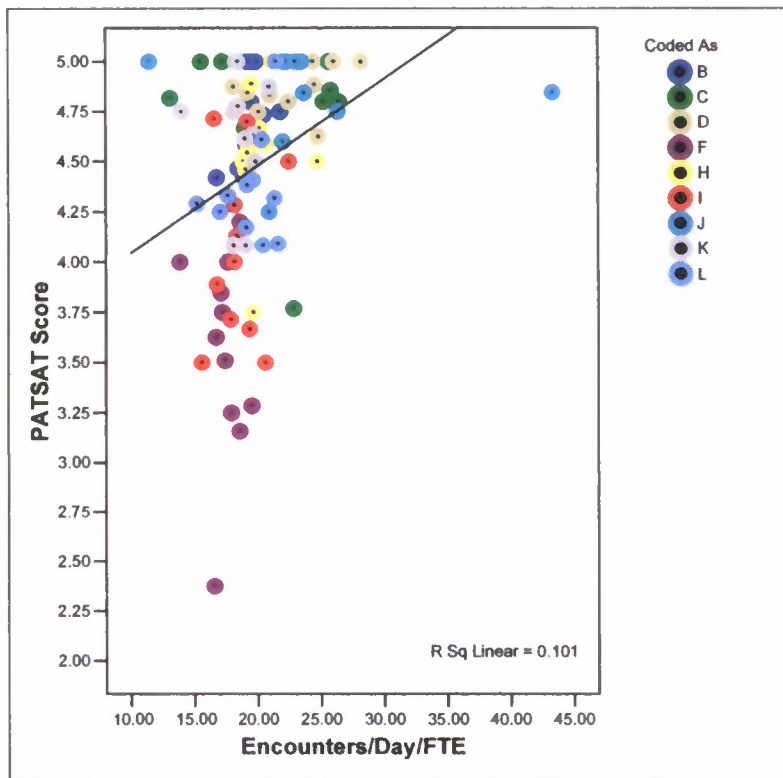
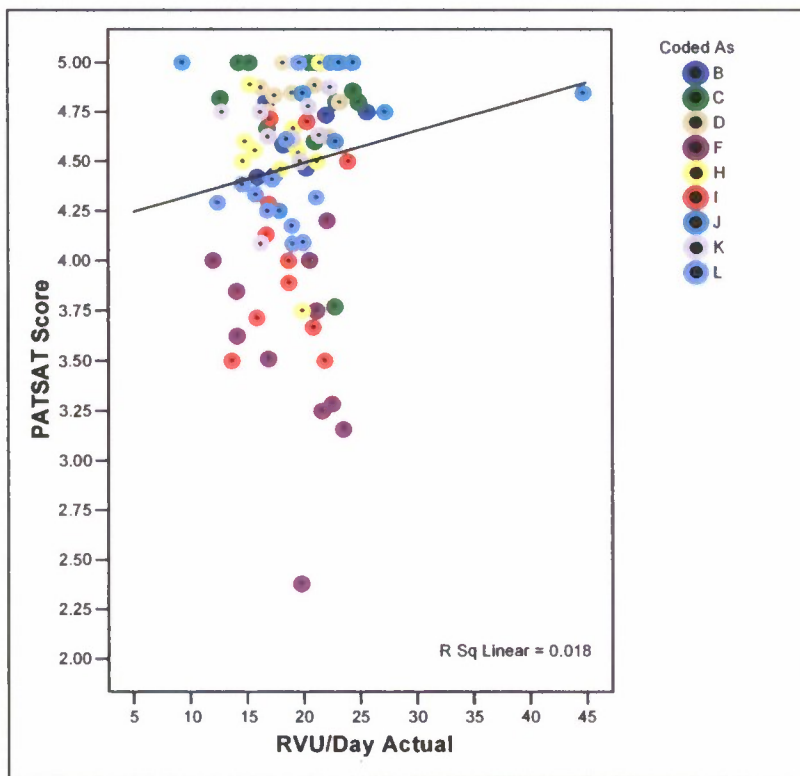*Figure 2.* Correlation of Patient Satisfaction Score and Encounters

Figure 3. Correlation of Patient Satisfaction Score and RVU per Day

Figure 4, Correlation of Patient Satisfaction Score and Month demonstrates no significant

correlation to month and reported Patient Satisfaction Score. This is important because MACH

is located at Fort Jackson, SC, largest Basic Combat Training (BCT) Center in the Army. This

hospital thus experiences significant fluctuations in potential patient population based on the

seasonality of increases in BCT trainees during the Summer months. Equally important, the

Health Clinic receives significantly fewer patients during the holidays due to the effect of the

holiday exodus. Further, even when trainee levels are relatively even for long periods of time,

the summer months often cause greater visits to the hospital due to the heat in South Carolina.

The impact of these variables, influx of potential patients during the summer, fewer patients

during the winter holiday period, and the effect of weather on the patient population, on patient
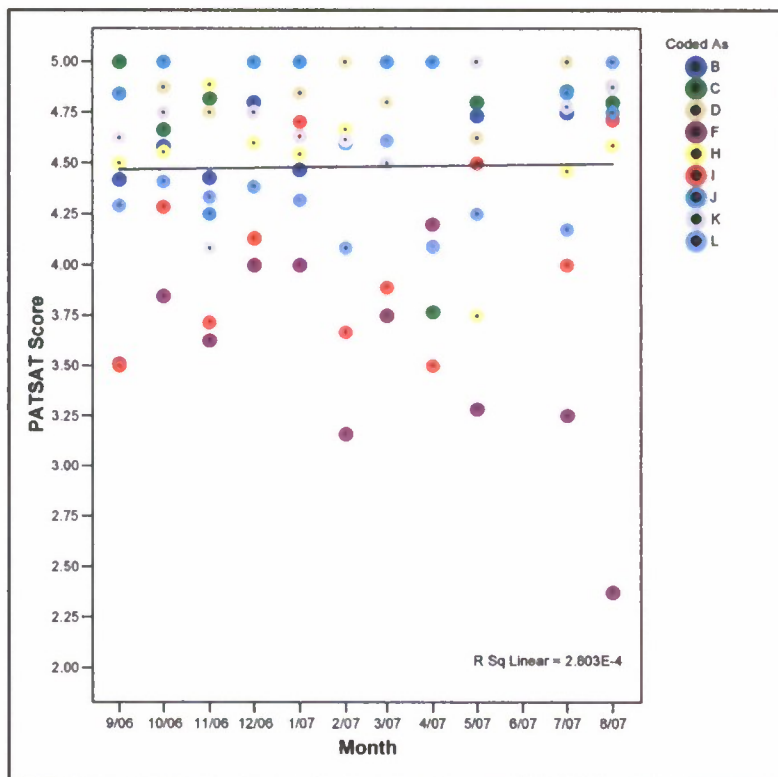

Figure 4. Correlation of Patient Satisfaction Score and Month

satisfaction is negligible. Providers with high patient satisfaction scores tend to consistently generate high RVUs and reported encounters; providers with low patient satisfaction scores do not.

Discussion and Recommendations

As discussed, a potential problem with these analyses is noticed in the graphically depicted relationship between patient satisfaction scores and both reported encounters and RVUs generated. It is apparent that deviations from the line of best fit had a significant impact on the total sum of squared distances from the regression line and that controlling for these outliers may in fact demonstrate a correlation more commiserate with the review of literature. Still, it is certainly helpful to demonstrate that in a facility this size, higher productivity leads to better patient satisfaction. It is also important to note that productivity is related to access, in this study, only inasmuch as without access there would be no productivity. Further, access and satisfaction with provider were individual and unrelated variables in terms of overall efficiency. With that in mind it is imprudent to suggest that as productivity increases, so does access; the point however, is that because access and patient satisfaction are not necessarily related, neither are access and efficiency. Future studies should use these data to determine the best mix of productivity and satisfaction such that a model emerges that may be adjusted to determine individual performance measures that best represent an organizations goals. It would be interesting to determine whether an organization may set different performance measures for similarly provided services. For instance, as the Department of Defense begins to compensate its civilian work force based on performance, a system may emerge that redefines initial performance standards on an individual basis. The goal therein would be to continue to enforce a minimum standard of goal based performance, productivity balanced with satisfaction, expected of every similarly employed provider. The means however might begin with

determining an individual's best comfortable mix of efficiency with the understanding that after a period of time, perhaps a six month probationary period, each individual provider is expected to adopt best practices with similar mixes. This may further be beneficial as best practices of efficiency occur to the extent that the model may adjust to a point until, ceteris paribus, the most efficient model of efficiency emerges.

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APPENDIX A
Referenced Tables

Table 6. *Data Collection Table.*

Provider	Month	Pat Sat (Q 7)	RVU/FTE/Month	Enc/FTE/Month
A1, B1, C1, etc.	SEP 06			
A2, B2, C2, etc.	OCT 06			
A3, B3, C3, etc.	NOV 06			
A4, B4, C4, etc.	DEC 06			
A5, B5, C5, etc.	JAN 07			
A6, B6, C6, etc.	FEB 07			
A7, B7, C7, etc.	MAR 07			
A8, B8, C8, etc.	APR 07			
A9, B9, C9, etc.	MAY 07			
A10, B10, C10, etc.	JUN 07			
A11, B11, C11, etc.	JUL 07			
A12, B12, C12, etc.	AUG 07			

Table 7. *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
Avg RVU/Encounter	99	0.8	1.3	0.97	0.1144
Encounters/Day/FTE	99	11.49367	43.34545	20.10417	3.81189
PATSAT Score	99	2.375	5	4.48175	0.52018
Valid N	99				

APPENDIX B
List of Tables and Figures